

**REMARKS**

**I. Formalities**

Applicant thanks the Examiner for acknowledging the claim for foreign priority and for confirming receipt of the certified copy of the priority documents.

Applicant also thanks the Examiner for considering the references cited with the Information Disclosure Statement filed on April 5, 2004.

However, the Examiner did not indicate whether the Formal Drawings filed on April 5, 2004 are accepted. Thus, Applicant respectfully requests that the Examiner acknowledge and approve the aforementioned Formal Drawings.

**II. Status of the Application**

By the present amendment, Applicant amends claims 1, 4 and 8. Applicant also hereby cancels claim 2 without prejudice or disclaimer.

Claims 1 and 3-8 are all the claims pending in the Application. Claims 1-8 have been rejected.

The present Amendment addresses each point of rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

**III. Claim Rejections Under 35 U.S.C. §112**

The Examiner has rejected claim 4 under 35 U.S.C. § 112, second paragraph, alleging that claim 4 recites the broad recitation “the optical data signals are Gb/s signals” and the claim also recites 10 Gb/s or 40 Gb/s signals” which is the narrower statement of the range/limitation. The grounds of rejection also allege that the phrase “in particular” renders the claim indefinite

because it is unclear whether the limitations following this phrase are part of the claimed invention.

Applicant has amended claim 4, as set forth above, to correct the informalities noted by the Examiner. Thus, Applicant respectfully requests that the Examiner withdraw this rejection.

**IV. Claim Rejections - 35 U.S.C. § 101**

The Examiner has rejected claim 8 under 35 U.S.C. § 101 alleging that the claim is directed toward non-statutory subject matter. Specifically, the Examiner alleges that Applicant cannot claim computer software since a computer program is merely a set of instructions capable of being executed by a computer, which permits the computer program's functionality to be realized and, therefore, a computer program itself is not capable of generating a clock signal out of an electrical data signal.

Applicant hereby amends claim 8, as set forth above, to recite the feature of a computer-readable medium encoded with a computer program for generating a clock signal. Applicant submits that amended claim 8 satisfies the requirements of 35 U.S.C. § 101 and respectfully requests that the Examiner withdraw this rejection.

**V. Claim Rejections - 35 U.S.C. § 102**

The Examiner has rejected claims 1, 3-5, 7 and 8 under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Publication No. 2002/0027692 to Uchiyama et al. (hereinafter "Uchiyama"). Applicant respectfully traverses these rejections for *at least* the reasons set forth below.

**A. Independent Claim 1**

Amended claim 1 recites (among other things):

...wherein the frequency filter transmits around  $B/n$ , wherein  $B$  is the bit rate of the electrical data signal.

The examiner acknowledges that Uchiyama fails to disclose or suggest the above feature.

02/09/07 Office Action, page 5. Therefore, Applicant submits that claim 1 is not anticipated by Uchiyama for *at least* these reasons.

Moreover, Applicant submits that it would not have been obvious for one of ordinary skill in the art to combine the disparate teachings of Uchiyama, with those of Agrawal, to arrive at the recitations of amended claim 1. As explained in the present specification, for instance, in non return to zero signals (hereinafter “NRZ”), the data signal does not contain a clock line at the bit rate frequency. However, if the bit rate frequency is  $B$ , a clock signal at the frequency  $f = B / 2$  can be extracted from the data signal by filtering the data signal at half its bit rate. *See e.g.*, page 2, lines 1-7.

In a distorted NRZ signal, the amplitude of the spectral component at half the bit rate is attenuated. However, consistent with the invention recited in claim 1, surprisingly, a clock signal can be extracted at a fraction lower than 2. Indeed, according to the claimed invention, a clock signal at exactly the bit rate frequency can be generated not only by frequency doubling ( $n = 2$ ), but with any higher multipliers  $n$  of the natural series as well. *See e.g.*, page 3, lines 5-14.

In contrast, Uchiyama teaches that phase comparison at a bit rate of 100 GBit/s or so is difficult to achieve. As such, Uchiyama suggests downconverting the bit rate frequency  $Nf_a$  of a received signal to a lower frequency through modulation. Uchiyama teaches that modulation of a signal having a frequency  $f_o$ , by using a frequency  $f_m$ , creates beat frequencies at  $f_o + f_m$  and  $f_o - f_m$ , as shown in FIG. 6B. Accordingly, the photo detector 22 detects the beat frequency component  $f_o - f_m$ , which is not a frequency component present in the incoming signal (as with the claimed invention), but, rather, is a beat frequency that is artificially created through modulation. Thus, the modulation factors  $k$  and  $h$  disclosed in Uchiyama relate to the order of the beat frequency in FIG. 6B (i.e.,  $f_o - f_m$ ,  $f_o - 2f_m$ , ...).

In view of the above, Applicant submits that one of ordinary skill in the art would not have been motivated to combine the disparate teachings of Uchiyama and Agrawal to arrive at the claimed invention. Indeed, the teachings of Uchiyama and Agrawal are fundamentally incompatible. More particularly, if a skilled artisan were to apply Agrawal's filter at the signal input, then Uchiyama's device would be rendered inoperable. And, MPEP § 2143.01 makes it clear that if the modification proposed by the Examiner would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.

Moreover, even *if* a skilled artisan *were* to combine the teachings of Uchiyama with those of Agrawal, and even *if* a skilled artisan *were* to ignore the Agrawal's express teaching to filter the highest available clock component from the received signal to create a clock signal, a skilled artisan *still* would not arrive at the invention recited in claim 1. This is because (among other

reasons) the multiplication factor  $n$  (i.e., the order of Uchiyama's beat frequency) is not the same as for the filter frequency  $B / n$  (a spectral component available in the received signal).

Accordingly, Applicant submits that claim 1 is patentable over the cited references for *at least* these additional reasons. Further, Applicant submits that the dependent claims 3-5, 7 are patentable over the cited references *at least* by virtue of their dependency on claim 1. Thus, Applicant respectfully requests that the Examiner withdraw these rejections.

**B. Independent Claim 8**

Independent claim 8 recites (among other things):

...wherein the electrical data signal is converted from an optical signal that is received from a source external to said receiver device.

The Examiner alleges that Uchiyama discloses or suggests all the recitations of claim 8. More particularly, the grounds of rejection allege that Uchiyama's bit-phase synchronized optical pulse stream local generator 100 corresponds to a receive device, as claimed. Further, the Examiner alleges that the electrical pulse stream generated by the photo detector 31 corresponds to the claimed feature of converting an electrical signal. Applicant respectfully disagrees.

Uchiyama fails to disclose or suggest that the electrical data signal relied upon by the grounds of rejection is converted from an optical signal that is received from a source external to the receiver device, as claimed. In stark contrast to the requirements of claim 8, Uchiyama discloses that the photo detector 31 is supplied with the branched optical pulse stream from the optical branching device 12 and that the photo detector 31 converts it to an electric pulse stream. Paragraph 0054. That is, Uchiyama discloses that the electric pulse stream therein is converted

from an optical pulse stream that is received from a source that is internal to the bit-phase synchronized optical pulse stream local generator 100.

Therefore, Uchiyama does not disclose, and cannot possibly suggest the feature of converting an electrical data signal from an optical signal that is received from a source external to said receiver device, as claimed. In fact, Uchiyama teaches just the opposite—that the photo detector 31 converts an electric pulse stream from an optical pulse stream that generated and received internally from the optical branching device 12.

Accordingly, Applicant submits that claim 8 is patentable over Uchiyama for *at least* these reasons and respectfully requests that the Examiner withdraw this rejection.

## **VI. Claim Rejections - 35 U.S.C. § 103**

### **A. Uchiyama in view of Agrawal**

The Examiner has rejected claim 2 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Uchiyama, in view of a publication entitled “Fiber-Optic Communication Systems,” by Govind P. Agrawal (hereinafter “Agrawal”).

Independent claim 2 has been canceled without prejudice or disclaimer and therefore the Examiner’s rejection of claim 2 is now moot.

### **B. Uchiyama in view of Hendrickson**

The Examiner has also rejected claim 6 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Uchiyama in view of U.S. Publication No. 2002/0110215 to Hendrickson (hereinafter “Hendrickson”). Applicant respectfully traverses this rejection for *at least* the reasons set forth below.

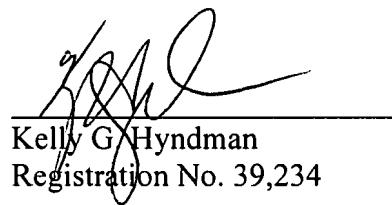
Claim 6 incorporates all the novel and non-obvious recitations of its base claim 1. For *at least* the reasons already discussed above, Uchiyama fails to disclose or suggest all the features of claim 1. Further, Agrawal fails to remedy the deficient teachings of Uchiyama. As such, Applicant submits that claim 6 is patentable over the cited references *at least* by virtue of its dependency and respectfully requests that the Examiner withdraw this rejection.

**VII. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Kelly G. Hyndman  
Registration No. 39,234

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE  
**23373**  
CUSTOMER NUMBER

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